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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/563,286	04/18/2008	Renata Mele	05788.0384	4336

7590 06/02/2010  
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Washington, DC 20001-4413

EXAMINER
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CHOW, CHARLES CHIANG

ART UNIT	PAPER NUMBER
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2618

MAIL DATE	DELIVERY MODE
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06/02/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/563,286	<b>Applicant(s)</b> MELE ET AL.	
	<b>Examiner</b> Charles Chow	<b>Art Unit</b> 2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) 1-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 26-50 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 1/3/2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/3/06; 4/18/08</u> . | 6) <input type="checkbox"/> Other: _____  |

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### **Detailed Action**

1. This office action for preliminary amendment 1/3/2006, having new claims 26-50, & claims 1-25 being cancelled.

### **Information Disclosure Statement**

2. The information disclosure statement (IDS) submitted on 1/3/2006, 4/18/2008 are in compliance with the provisions of 37 CFR 1.97. According, the information disclosure statement is being considered by the examiner.

### **Claim Objected**

3. Claims 37, 39 are objected to because of the following informalities: The "that" in "lower that" is incorrect. Appropriate correction is required.

Assuming "that" is "than" for the examination purpose.

### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 26-28, 31-33, 40, 46-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laubacher et al. [ US 6,688,127 ] in view of Abdelmonem et al. [ US 6,622,028 ].

**For claim 26, Laubacher et al. [ Laubacher ] discloses a receiver front-end [ Fig.6B/Fig. 6A & their description ] for use in a transceiver station of a wireless communication network [ base station in wireless network, col. 15, lined 47 to col. 16, line 28 ],**

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said transceiver station being associated with an antenna assembly comprising a primary and at least a secondary antenna [ antenna assembly has main antenna 610 & diversity antenna 605, Fig. 6B/col. 15, lines 42-66 ],

said receiver front-end [ 630/680, Fig. 6B; front end 205 ] being adapted for insertion between said antenna assembly [ 610/605 ] and signal processing sections of said transceiver station [ the front 205 is followed by active-circuit 210 which has combination of amplifier, mixer, analog-to-digital converters, digital processor, col. 14, line 57 to col. 15, line 11 ],

said receiver front-end comprising a primary and at least a secondary receiving branch [ main branch for antenna 610/cryogenic unit 630 and second branch for antenna 605/cryogenic unit 680 in Fig. 6B, col. 15, lined 47 to col. 16, line 28 ],

said primary receiving branch [ 610/630 ] being adapted for coupling to said primary antenna [ 610 ] and to said signal processing sections of said transceiver station [ such as active 210 in col. 14, line 57 to col. 15, line 11 ] and

said secondary receiving branch [ 605/680 ] being adapted for coupling to said secondary antenna [ 605 ] and to said signal processing sections [ such as active 210 col. 14, line 57 to col. 15, line 11];

said secondary receiving branch comprising at least a superconducting component.

[ the high temperature superconductor HTS filter 645 in the second branch 680, Fig. 6B, col. 16, lines 3-18 ].

Laubacher fails to teach the non-superconducting components.

**Abdelmonem** et al. [ Abdelmonem ] teaches the primary receiving branch comprising non-superconducting components, comprising at least a non-superconducting filter

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[ the normal conventional filter 60 connected to LNA 154 for one of the branch in front end 150, Fig. 4/col. 8, lines 23-48, any non-HTS band pass filter can be used for filter 60, for better signal rejection, noise floor in col. 6, lines 42-53 ], such that the filtered signal rejection, noise floor, can be better. Therefore, one of ordinary skill in the art at the time the invention was made would have been obvious to improve Laubacher with Abdelmonem's teachings above, such that the signal reject, noise floor, would be better.

**For claim 27**, Abdekninem teaches the wherein said primary receiving branch does not comprise superconducting components [ the normal conventional filter 60, Fig. 4/col. 8, lines 23-48, any non-HTS band pass filter can be used for filter 60, for better signal rejection, noise floor in col. 6, lines 42-53]. Therefore, one of ordinary skill in the art at the time the invention was made would have been obvious to improve Laubacher with Abdelmonem's teachings above, such that the noise figure would be better.

**For claim 28**, Laubacher teaches the wherein said superconducting component comprises a low-loss filter obtained with a technology based on high critical temperature superconducting materials [ the HTS filter provides extremely low in-band insertion loss, col. 1, lines 53-59 ].

**For claim 31**, Laubacher fails to teach the non-cryogenic.

Abdelmonem teaches the wherein said primary receiving branch comprises a non-superconducting receiving filter and a non-cryogenic, low-noise amplifier mutually connected in cascade arrangement [ the normal conventional non-HTS filter 60 & LNA 154, structure in Fig. 4 ]. Therefore, one of ordinary skill in the art at the time the invention was made would have been obvious to improve Laubacher with Abdelmonem's teachings above, such that the noise figure would be better, based on the selected filter.

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**For claim 32**, Laubacher teaches the wherein said primary receiving branch comprises a non-superconducting receiving filter and a cryogenic, low-noise amplifier mutually connected in cascade arrangement [non-superconducting receiving filter 675 and cryogenic 640, structured in Fig. 61A ].

**For claim 33**, Laubacher teaches the wherein said low-loss filter [ 635/Fig. 6A], said cryogenic, low-noise amplifier [ 640 ] of said primary receiving branch and said cryogenic, low-noise amplifier [ 650 ] of said secondary receiving branch are enclosed in a cryogenic refrigerator unit [ 630, description of Fig. 6A ].

**For claim 46**, **Laubacher** discloses a method for improving reliability of a receiver front-end [ Fig.6B/Fig. 6A, & their description, abstract/summary of invention ] for use in a transceiver station of a wireless communication network [ base station in wireless network, col. 15, lined 47 to col. 16, line 28 ], comprising the steps of

sending primary and secondary radio signals to a primary and, respectively, a secondary antenna, said primary and secondary antennas being included in an antenna assembly comprised in said transceiver station [ the base station's antenna assembly receives signals on main antenna 610 & diversity antenna 605, Fig. 6B/col. 15, lines 42-66 ],

sending the resulting primary and secondary radio signals to signal processing sections of said transceiver station [ the front 205 is followed by active-circuit 210 which has combination of amplifier, mixer, analog-to-digital converters, digital processor, to process received signal, base station, from amp 655/660, col. 14, line 57 to col. 15, line 11 ].

Laubacher fails to teach the filtering at non-cryogenic temperatures.

Abdelmonem teaches filtering said primary radio signal at non-cryogenic temperatures [ the non-HTS filter 60 ]; processing said secondary radio signal at cryogenic temperatures

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[ processing secondary signal from 60 at LNA 206 in the cryogenic unit 204, description of Fig. 5 in col. 8 ], such that the filtered signal rejection, noise floor, can be better. Therefore, one of ordinary skill in the art at the time the invention was made would have been obvious to improve Laubacher with Abdelmonem's teachings above, such that the signal reject, noise floor, would be better.

**For claim 47**, Laubacher wherein said step of processing said secondary radio signal at cryogenic temperatures comprises the step of filtering said secondary radio signal to select a desired frequency band within a communication band; and amplifying said filtered secondary radio signal without introducing any significant losses

[ in cryogenic unit 680, band pass HTS filter 645 selects band and output it to LNA 650, Fig. 6B; symbol in Fig. 6A for band pass filter 645 & col. 13, lines 56-65, in communication band in col. 9, lines 46-65].

**For claim 48**, Laubacher teaches the comprising the step of amplifying said primary radio signal at non-cryogenic temperatures [ outside cryogenic unit 630, 655 amplifies signal at non-cryogenic temperatures, Fig. 6B/Fig. 6A ].

**For claim 49**, Laubacher teaches the comprising the step of amplifying said primary radio signal at cryogenic temperatures [ 640 amplifies signal inside cryogenic unit 630, with cryogenic temperatures, Fig. 6B/Fig. 6A ].

**For claim 50**, Laubacher teaches the wherein said signal processing sections [ active circuit 210 ] are coupled to said receiver front-end [ the front 205 is followed by active-circuit 210 which has combination of amplifier, mixer, analog-to-digital converters, digital processor, col. 14, line 57 to col. 15, line 11; Eddy et al. US 2005/0026,588 also teaches the front ends 110 coupled to processor 500 having demodulator 504, A/D/down converter 502/504, parag. 0042/description of Fig. 4 ].

5. Claims 29-30, 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laubacher in view of Abdelmonem-'028, as applied to claim 28 above, and further in view of Abdelmonem et al. [ US 2002/0151,331 ].

**For claim 29**, Laubacher view of Abdelmonem-'028 fails to teach LNA connected to filter.

Abdelmonem et al. [Abdelmonem-331 ]The receiver front-end according to claim 28, wherein said secondary receiving branch comprises a cryogenic, low-noise amplifier LNA cascade connected to said low-loss filter [ the LNA 54 connected to minimum loss filter 28 in different branches, cooled by 18, Fig. 2/parag. 0032-0033 ]. Therefore, one of ordinary skill in the art at the time the invention was made would have been obvious to improve Laubacher, Abdelmonem-'028 with Abdelmonem-331's teachings above, such that the LNA could be connected to a low loss filter.

**For claim 30**, Laubacher teaches the wherein said low-loss filter and said cryogenic, low-noise amplifier are both enclosed in a cryogenic refrigerator unit operating at cryogenic temperatures [ the cryogenic unit 680 contains both low loss HTS filter 645 & LNA 650, col. 16, lines 19-28 ].

**For claims 34-36**, Laubacher teaches the wherein said cryogenic refrigerator unit operates at cryogenic temperatures lower than 250 K, lower than 100 K, higher than 60 K [ the cooling temperature can be 80K, col. 9, lines 33-45 ].

6. Claims 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laubacher in view of Abdelmonem-'028, as applied to claim 28 above, and further in view of Abdelmonem et al. [ US 2003/0227,350 ].

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**For claims 37-39,** Laubacher fails to teach the filter's noise figure.

Abdelmonem-'028 teaches the wherein said low-loss filter has a noise figure lower than 0.7 dB, lower than 0.5 dB [ the HTS filter has noise filter less than 0.5 dB, col. 6, lines 34-41 ]; and Abdelmonem-'350 teaches the wherein said low-loss filter has a noise figure lower than 0.3 dB [ the filter 100 can provide 0.2 dB insertion loss for the additive noise to noise figure, parag. 0030/Fig. 3 ], such that the filter's noise figure can be less than 0.3 dB.

Therefore, one of ordinary skill in the art at the time the invention was made would have been obvious to improve Laubacher, Abdelmonem-'028 with Abdelmonem-'350's teachings above, such that the filter's noise figure would be lower than 0.3 dB.

7. Claims 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laubacher in view of Abdelmonem, as applied to claim 26 above, and further in view of Hey-Shipton [ US 2005/0164,888 ].

**For claims 41-42,** Laubacher in view of Abdelmonem fails to teach the secondary transmission branch.

Hey-Shipton teaches the wherein said secondary receiving branch is connected in parallel to a secondary transmission branch, said secondary transmission branch comprising a transmitting filter; wherein said transmitting filter in said secondary transmission branch is obtained with a technology based on high critical temperature superconducting materials

[ second receiving branch 925-n in parallel with secondary transmission branch in 920-n, description of Fig. 9/parag. 0067, having superconducting filter for each 920-n; superconducting filter 710 for transmitting side, Fig. 7, is the HTS filter, parag. 0065/0064 ], such that the filtered signal for transmitting can be better with the filter rejection. Therefore, one of ordinary skill in the art at the time the invention was made would have been obvious

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to improve Laubacher, Abdelmonem with Hey-Shipton's teachings above, such that the filtered signal for transmitting would be better with the filter rejection.

8. Claims 43-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laubacher in view of Abdelmonem, as applied to claim 26 above, and further in view of Patton et al. [ US 6,263,215 ].

**For claim** 43-44, Laubacher in view of Abdelmonem fails to teach the loss due to distance to antenna, negligible with respect to the noise figure.

Patton et al. [ Patton ] teaches the wherein the receiver front-end is mounted at such a distance from said antenna assembly that losses due to antenna lead-in are negligible with respect to the noise figure introduced by said receiver front-end, wherein said distance is no greater than 3 meter, no greater than 1 meter

[ the low loss cable 64 for connection from antenna to front end is less than 0.5 dB to minimize insertion loss, which is negligible to noise figure, col. 8, lines 16-38; the no more than 10 feet cable which is less than 3.05 meter, for the no greater than 3 meters, in col. 8, lines 16-27 ], such that the signal loss can be improved with low loss cable connection.

Therefore, one of ordinary skill in the art at the time the invention was made would have been obvious to improve Laubacher, Abdelmonem with Patton's teachings above, such that the signal loss would be improved with low loss cable connection.

9. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Laubacher in view of Abdelmonem, Patton, as applied to claim 44 above, and further in view of Jervis [ US 6,011,524 ].

**For claim** 45, Laubacher, Abdelmonem, Patton fail to teach the one meter distance.

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Jervis teaches the wherein said distance is no greater than 1 meter [ the LNA is positioned no more distant than one meter from the antenna, col. 3, lines 52-65 ], such that the signal loss can be improved with shorter cable connection. Therefore, one of ordinary skill in the art at the time the invention was made would have been obvious to improve Laubacher, Abdelmonem, Patton with Jervis' teachings above, such that the signal loss would be improved with shorter cable connection.

### **Conclusion**

10. The prior arts made of record are not relied upon are considered pertinent to applicant's disclosure.

A. Other prior arts are also considered. They are: Russo [ US 6,424,135 ], Kobayashi et al. [ US 6,367,266 ], Patton et al. [ US 6,104,934 ], Enoki et al. [ US 5,835,853 ], Hori [ US 5,023,939 ], Wagner [ US 3,744,467 ], Yandrofski et al. [ US 5,472,935 ], Van Duzer [ US 5,215,959 ].

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Chow whose telephone number is (571) 272-7889. The examiner can normally be reached on 8:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duc Nguyen can be reached on (571) 272-7503. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system.

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Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Charles Chow/  
Examiner, Art Unit 2618  
May 27, 2010.

/Duc Nguyen/

Supervisory Patent Examiner, Art Unit 2618